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METHOD AND ARRANGEMENT FOR PACKAGING DISCRETE DRUGS AND/OR
FOODSTUFFS SUCH AS FOR INSTANCE TABLETS OR CAPSULES

[WERKWIJZE EN INRICHTING VOOR HET VERPAKKEN VAN DISCRETE
MEDICAMENTEN EN VOEDINGSMIDDELEN ZOALS BIJVOORBEELD PILLEN]

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Title: **Method and arrangement for packaging discrete drugs and/or foodstuffs such as for instance tablets or capsules.**

The invention relates to a method according to the opening paragraph of claim 1.

Such a method is generally known and is applied among others for packaging capsules or tablets in blister packaging.

A disadvantage of the known packaging method is that with the passage of time, the discrete drugs or foodstuffs to be packaged deteriorate in their packaging under influence of the air surrounding the drugs or foodstuffs in the packaging, and in particular under influence of oxygen in the air. Because of the deterioration, the packaged drugs or foodstuffs have limited shelf life, which in practice is experienced as a significant disadvantage.

The goal of the invention is a method of the type mentioned in the opening paragraph that does not have the mentioned disadvantages.

To this end, the method is characterized by the measures of claim 1.

By surrounding the drugs and/or foodstuffs in the delivery tube with a gas that is inert, at least relative to the drugs and/or foodstuffs, the probability is very small that air will still be present around the drugs and/or foodstuffs in the packaging.

By supplying an inert gas via a separate gas delivery line to the packaging, after or during filling, the discrete drugs and/or foodstuffs would still draw with them air via the delivery tube and therefore air would still end up in the packaging. The measures of the method according to the invention overcome this drawback.

The invention relates also to an arrangement used with a method according to the invention.

The arrangement consists of a feed bowl, a delivery tube connected to the feed bowl, a packaging feed mechanism and a closing mechanism for closing the packages. Such an arrangement is known for instance for filling blister packages with tablets. In order to make a known arrangement suitable for the method according to the invention, it is characterized by the measures according to claim 6.

Such arrangement for carrying out the method is of simple construction and economical in execution. It is even possible to convert in a simple manner an existing blister packaging machine, such as for instance an available packaging machine, into a packaging machine according to the invention. By connecting the feed bowl via the gas supply line with a gas cylinder, the volume of the bowl, besides being filled with the discrete drugs and/or foodstuffs, can also be filled in a simple manner with inert gas. If an inert gas is used that is heavier than air, the gas will flow together with the products to be packaged via the delivery tube into the packaging

without requiring a separate pump. Since the gas flows under the influence of gravity from the bowl into the packaging, the speed of the gas stream is rather low, so that upon arrival at the packaging there is no aspiration of surrounding air, which would be caused by the vacuum created by a high speed gas stream.

Further elaborations of the method and arrangement according to the invention are described in the dependent claims and are explained in more detail by means of two examples of execution forms of the arrangement.

Figure 1 shows an isometric view of a first execution form of the arrangement; and

Figure 2 shows a similar view of a second execution form of the arrangement.

Both execution forms of the arrangement shown in the figures are suitable for use with a method according to the invention and are provided with a feed bowl 1, a delivery tube 2 connected to feed bowl 1, a packaging feed mechanism (not shown) and a closing mechanism (not shown) for closing of the packaging. The arrangements are characterized according to the invention by providing the feed bowl 1 with a gas supply line 3, which is connected via a gas supply connection opening 4 with the bowl volume 5 of feed bowl 1. The gas supply line 3 can be connected to a gas cylinder (not shown), by means of which the bowl volume 5 can be filled with inert gas.

Both execution forms relate to an arrangement for packing in blister packaging. The blister shell part 11 is fed as a continuous strip 11. The delivery tube 2 for the discrete drugs and/or foodstuffs, in this case tablets, discharges at the fill location 12 above the not yet closed blister shell 11. A gas delivery line 7 discharges immediately before a closing position 13 where the blister shell 11 is closed with a foil 14.

The fill opening forming upper part of bowl 1, in other words the opening through which the discrete drugs and/or foodstuffs P are dumped in bowl 1, can be constructed for gastight closing by means of a cover 6. This is in particular important for inert gases that are lighter than air. Such gases will escape from the bowl unless they are retained by a cover 6.

Furthermore, both execution forms are provided with the previously mentioned gas delivery line 7, which is connected with bowl 1 and ends in the bowl volume 5 via a gas delivery tube connection opening 8, said opening is covered with a gas permeable material, such as for instance gauze, which stops the discrete drugs and/or foodstuffs P. By means of the gas delivery line 7, inert gas coming from the bowl volume 5a can be supplied to the packaging before it is closed. Because of the presence of the gas permeable material 9, which stops the discrete drugs and/or foodstuffs P, the latter are not delivered via the gas delivery line 7. Such gas delivery line

7 can be necessary if the diameter of the delivery line 2 is so small that the quantity of inert gas flowing via the delivery line 2 to the packaging is too small.

In a particularly favorable execution form, which is also applied in both execution examples, the gas permeable material 9 delimits together with at least a part of the wall of bowl 1 a partial volume 5a of the bowl volume 5. The partial volume 5a is not accessible by the discrete drugs and/or foodstuffs P. Both the gas supply line connection opening 4 and the gas delivery line connection opening 8 end in the partial volume 5a, so that a significant quantity of gas can flow unhindered, this means not hindered by the discrete drugs and/or foodstuffs P, from the gas supply line connection opening 4 to the gas delivery line connection opening 8.

For regulation of the quantity of gas supplied to bowl 1 and of the quantity of gas supplied from bowl 1 via gas delivery line 7, the gas supply line 3 and the gas delivery line 7 can each be provided with a regulating valve 10 for regulation of the gas flow passing through the lines. The regulating valve of the gas supply line 3 is not shown because it is mounted on a not shown cylinder containing the gas.

The execution form of figure 2 distinguishes itself from figure 1 in that the blister shell strip 11 is protected from the atmosphere, at the location of the section between fill position 12 and closing position 13, by a tube 15 in which

the discharge openings 2a, 7a are located of respectively delivery tube 2 and gas delivery line 7.

One of the walls of tube 15 is provided with holes 16. The edges of holes 16 are connected in airtight manner with gloves that extend inside tube 15 and are used to perform manipulations inside tube 15 without allowing inflow of air. By means of the gloves, an operator can, for instance, place in the blisters tablets that did not land in the blister packaging. With fully automated feed control of the discrete drugs and/or foodstuffs, the presence of holes 16 and the associated gloves is of course not required and the walls of tube 15 can be completely closed.

The arrangement functions as follows:

Drugs and/or foodstuffs, such as for instance tablets or capsules, are supplied in bulk from above to bowl 1. The tablets and capsules slide individually via the delivery tube 2 to the packaging such as for instance a jar, a bottle, a bag, the profiled packaging half 11 of blister packaging, or similar packaging. Besides tablets, capsules or similar discrete drugs and/or foodstuffs P, a gas that is inert, relative to the drugs and/or foodstuffs, is also supplied through delivery tube 2.

The gas is delivered into the bowl volume 5 of bowl 1 via a gas supply line 3. Carbon dioxide (CO₂) or nitrogen (N₂) can be used, for instance, as gas, which offers the advantage that these gases are heavier than air and therefore flow

automatically through delivery tube 2 to the packaging to be filled without requiring an overpressure in feed bowl 1. If necessary, inert gas is supplied to the packaging via the gas delivery line 7 immediately before the packaging is closed.

It is clear that the invention is not limited to the described execution form, but that various modifications are possible within the scope of the invention. The essential element is that discrete drugs and/or foodstuffs are surrounded by inert gas during the delivery path, so that in no case air is drawn into the packaging together with the products to be packaged.

SCOPE OF PATENT CLAIMS

1. Method for placing discrete drugs and/or foodstuffs (P) in packaging, such as for instance tablets or capsules, whereby the discrete drugs and/or foodstuffs (P) are delivered, via a delivery tube (1) [Translator's note: should be (2)], which is provided with a delivery opening 2a, to the packaging, such as for instance a bottle, a jar, a bag or a blister packaging (11), with the characteristic that an inert gas is delivered also via delivery tube (2) in the direction of the discharge opening (2a).
2. Method according to claim 1, with the characteristic, that the inert gas is nitrogen or carbon dioxide.
3. Method according to claim 1 or 2, with the characteristic, that a feed bowl (1) is connected at the end opposite to discharge opening (2a) of delivery tube (2), in which the discrete drugs and/or foodstuffs (P) are deposited and in which the inert gas is also delivered.
4. Method according to claim 3, with the characteristic, that the gas pressure in bowl (1) is approximately atmospheric, and that as inert gas is selected a gas that is heavier than air, whereby the inert gas flows through the delivery tube (2) under the influence of gravity in the direction of discharge opening (2a).

5. Method according to one of above claims, with the characteristic, that the packaging is a blister packaging (11), to which inert gas is delivered immediately before it is closed.
6. Arrangement used with the method according to one of the previous claims, provided with a feed bowl (1), a delivery tube (2) connected to feed bowl (1), a packaging feed mechanism and a closing mechanism for closing of the packaging, with the characteristic, that feed bowl (1) is provided with a gas supply line (3) which is connected via a gas supply line connection opening (4) with the bowl volume (5) of feed bowl (1), whereby the gas supply line can be connected to a gas cylinder, by means of which the bowl volume (5) can be filled with inert gas.
7. Arrangement according to claim 6, with the characteristic, that the fill opening forming the upper part of bowl (1) can be closed gastight with a cover (6).
8. Arrangement according to claims 6 or 7, with the characteristic, that a gas delivery line (7) is connected with bowl (1), which ends in the bowl volume (5) via a gas delivery line connection opening (8), said opening (8) is covered with a gas permeable material (9) that stops the discrete drugs and/or foodstuffs.
9. Arrangement according to claim 8, with the characteristic, that the gas permeable material (9) delimits together with at least a part of bowl wall (1) a

partial volume (5a), that is inaccessible for discrete drugs and/or foodstuffs (P), the gas supply line connection opening (4) and the gas delivery line connection opening (8) end in this partial volume (5a).

10. Arrangement according to one of claims 8 or 9, with the characteristic, that the gas supply line (3) and the gas delivery line (7) are each provided with a regulating valve (10) for regulating the gas flow passing through the lines.

11. Arrangement according to one of claims 6-10, with the characteristic, that the packaging is a blister packaging (11), of which the blister shell part (11) is fed as a continuous strip, whereby the delivery tube (2) for the discrete drugs and/or foodstuffs ends at the fill position (12) location above the not yet closed blister shell part (11), whereby the gas delivery line (7) ends immediately before a closing position (13) where the blister shell part (11) is closed with a foil (14).

12. Arrangement according to claim 11, with the characteristic, that at the location of the section between and around the fill position (12) and closing position (13), the blister shell strip (11) is protected from the atmosphere by a tube (15) in which emerge the delivery openings (2a, 7a) of delivery tube (2) and gas delivery tube (7).

13. Arrangement according to claim 12, with the characteristic, that at least one of the walls of tube (15) is provided with holes (16), and the edges of openings (16) are connected in airtight manner with gloves, which extend in the interior space of the tube for performing manipulations in the tube (15) without allowing inflow of air.

Figure 1



